

CLAIMS

We claim:

- 1     1.     An inductor assembly configured to generate a combined stream of pressurized  
2     air and product, comprising:  
3         an inductor chamber that defines an interior cavity configured to receive a supply  
4     of product, the inductor chamber including a forward sidewall, a rearward sidewall, and a  
5     bottom wall therebetween;  
6         an inlet tube extending through the forward sidewall and configured to direct a  
7     stream of pressurized air toward the supply of product in the interior cavity of the  
8     inductor chamber so as to generate the combined stream of pressurized air and product;  
9     and  
10         an outlet tube extending through the rearward sidewall opposite the inlet tube, the  
11     outlet tube being configured to discharge the combined stream of air and product from  
12     the inductor chamber, the outlet tube having a first end and an second end, the first end  
13     of the outlet tube having a cross-sectional area greater than a cross-sectional area of the  
14     second end of the outlet tube.
- 1     2.     The inductor assembly as recited in claim 1, wherein  
2         the inlet tube includes a first end configured to receive the pressurized air stream  
3     and a second end configured to discharge the stream of pressurized air into the interior  
4     cavity;

5           the first end of the outlet is disposed in the interior cavity opposite the second end  
6   of the inlet tube and the second end of the outlet tube is configured to discharge the  
7   stream of pressurized air and product; and

8           the outlet tube includes a conical shape portion between the first end and the  
9   second end of the outlet tube.

1   3.     The inductor assembly as recited in claim 2, further comprising a cover assembly  
2   disposed in the interior cavity between the inlet tube and the outlet tube, the cover  
3   assembly being adjustable to selectively regulate entrainment of the product into the air  
4   stream.

1   4.     The inductor assembly as recited claim 3, wherein the cover assembly includes:  
2           a cover generally aligned with an upper portion of the second end of the inlet tube  
3   and an upper portion of the first end of the outlet tube; and  
4           at least one flap member pivotally coupled to the cover.

1   5.     The inductor assembly as recited in claim 4, wherein the at least one flap member  
2   has a first position configured to purge product deposited in and downstream of the outlet  
3   tube while simultaneously preventing product from entering the outlet tube.

1   6.     The inductor assembly as recited in claim 4, wherein the cover and the at least one  
2   flap member in a first position directs discharge of the stream of pressurized air from the

- 3 second end of the inlet tube toward the first end of the outlet tube and simultaneously
- 4 prevent product from entering the outlet tube.

1     7.     An inductor assembly configured to generate a combined stream of pressurized  
2     air and product, comprising:  
3             an inductor chamber that defines an interior cavity configured to receive a supply  
4     of product;  
5             a trajectory control assembly movable to selectively direct a pressurized air  
6     stream into the interior cavity of the inductor chamber so as to generate the combined  
7     stream of air and product; and  
8             an outlet tube configured to discharge the combined stream of air and product  
9     from the inductor chamber.

1     8.     The inductor assembly as recited in claim 7, further comprising an inlet tube  
2     extending into the inductor chamber, wherein the trajectory control assembly is coupled  
3     to the inlet tube.

1     9.     The inductor assembly as recited in claim 7, wherein the trajectory control  
2     assembly includes:  
3             a trajectory tube extending into the inductor chamber along a central axis;  
4             at least one deflector disposed inside the trajectory tube at an angle relative to the  
5     central axis of the trajectory tube; and  
6             a handle coupled to the trajectory tube, the handle operable to selectively move  
7     the deflector to change direction of the pressurized air stream discharged from the  
8     trajectory tube.

- 1    10.    An inductor assembly configured to generate a combined stream of pressurized  
2    air and product, comprising:  
3            an inductor chamber that defines an interior cavity configured to receive a supply  
4    of product, the inductor chamber including a forward sidewall, a rearward sidewall, and a  
5    bottom wall therebetween;  
6            an inlet tube that extends through the forward sidewall and configured to direct a  
7    pressurized air stream toward the supply of product so as to generate the combined  
8    stream of air and product; and  
9            an adjustable outlet assembly that extends through the rearward sidewall opposite  
10   the inlet tube and configured to discharge a combined stream of pressurized air and  
11   product from the inductor chamber, the adjustable outlet assembly including an  
12   adjustable outlet tube selectively extendable inward and outward relative to the interior  
13   cavity, the adjustable outlet tube including a first end having a cross-sectional area that is  
14   smaller relative to a cross-sectional area of a second end of the outlet tube.
- 1    11.    The inductor assembly as recited in claim 10, further comprising an outlet tube  
2    extending into the inductor chamber, the adjustable outlet assembly slidably disposed  
3    inside the outlet tube.

12. A product conveyance system for distributing a supply of product in an agricultural environment, comprising:

- a hopper configured to contain the supply of product;
- a pressurized air source operable to provide a stream of pressurized air;
- a distribution system configured to apply the product in the agricultural environment, the distribution system including a distribution line having a cross-sectional area; and
- an inductor assembly configured to provide a combined stream of pressurized air and product to the distribution system, the inductor assembly including:
  - an inductor chamber that defines an interior cavity configured to receive a supply of product, the inductor chamber including a forward sidewall, a rearward sidewall, and a bottom wall therebetween;
  - an inlet tube extending through the forward sidewall and configured to direct a stream of pressurized air toward the supply of product in the interior cavity of the inductor chamber so as to generate the combined stream of pressurized air and product; and
  - an outlet tube extending through the rearward sidewall opposite the inlet tube, the outlet tube being configured to discharge the combined stream of air and product from the inductor chamber and conveyed in the distribution line of the distribution system, the outlet tube having a first end and a second end, the first end of the outlet tube having a cross-sectional area greater than a cross-sectional area of the second end of the outlet tube and the distribution line.

1     13.     The product conveyance system as recited in claim 12, further comprising a  
2     trajectory control assembly coupled to the inlet tube and movable to selectively direct the  
3     pressurized air stream into the interior cavity of the inductor chamber.

1     14.     The product conveyance system as recited in claim 13, wherein the inlet tube  
2     extends along a central axis and the trajectory control assembly includes at least one  
3     deflector disposed at an angle relative to the central axis.

1     15.     The product conveyance system as recited in claim 14, wherein the trajectory  
2     control assembly further includes:  
3             a trajectory tube disposed inside the inlet tube;  
4             the at least one deflector disposed inside the trajectory tube; and  
5             a handle coupled to the trajectory tube and extending through a slot disposed in  
6     the inlet tube, the handle configured to selectively direct the discharge of pressurized air  
7     into the interior cavity.

1     16.     The product conveyance system as recited in claim 12, further comprising an  
2     adjustable outlet assembly slidably coupled to the outlet tube, the adjustable outlet  
3     assembly including an adjustable outlet tube selectively positionable inward and outward  
4     relative to the interior cavity of the inductor chamber.

1 17. The product conveyance system as recited in claim 16, wherein the adjustable  
2 outlet tube includes a first end and a second end, the first end having a cross-sectional  
3 area smaller relative to a cross-sectional area of the second end of the adjustable outlet  
4 tube.

1 18. A product conveyance system for distributing a supply of product in an  
2 agricultural environment, comprising:

3 a hopper configured to contain the supply of product;

4 a forced air source operable to provide a stream of forced air;

5 a distribution system configured to apply the product to the field; and

6 an inductor assembly, including:

7 an inductor chamber that defines an interior cavity configured to receive  
8 the supply of product;

9 a trajectory control assembly movable to selectively direct the stream of  
10 pressurized air into the interior cavity of the inductor chamber so as to  
11 generate a combined stream of air and product; and

12 an outlet tube configured to pass the combined stream of air and product

13 from the interior cavity of the inductor assembly to the distribution system.

1 19. The product conveyance system as recited in claim 18, wherein the trajectory  
2 control assembly includes:

3 a trajectory tube extending along a central axis and slidably coupled to the

4 inductor chamber; and



5           at least one deflector disposed in the trajectory tube at an angle relative the central  
6   axis of the trajectory tube.

1   20.    The product conveyance system as recited in claim 18, wherein the trajectory  
2   control assembly includes:

3           an inlet tube extending into the inductor chamber;

4           a trajectory tube slidably coupled inside the inlet tube along a central axis;

5           at least one deflector disposed inside the trajectory tube at angle relative to the  
6   central axis of the trajectory tube; and

7           a handle coupled to the trajectory tube, the handle selectively moves the deflector  
8   to selectively direct the pressurized air stream into the interior cavity of the inductor  
9   chamber.

1   21.    The product conveyance system as recited in claim 20, wherein the inlet tube  
2   directs the forced air stream in a substantially downward and inward direction relative to  
3   the inductor chamber, and wherein the outlet tube is disposed opposite the inlet tube and  
4   configured direct the combined air stream in a substantially upward and outward  
5   direction relative to the inductor chamber.

- 1     22.     A product conveyance system, comprising:
- 2             a hopper configured to contain a supply of product;
- 3             a forced air source operable to provide a stream of pressurized air;
- 4             a distribution system configured to apply the supply of product in an agricultural
- 5     environment; and
- 6             an inductor assembly configured to provide a combined stream of pressurized air
- 7     and product to the distribution system, the inductor assembly including:
- 8             an inductor chamber that defines an interior cavity configured to receive
- 9             the supply of product from the hopper;
- 10            a trajectory control assembly having a rotatable inlet tube configured to
- 11            selectively direct the pressurized air stream into the interior cavity as to
- 12            generate the combined stream of pressurized air and product;
- 13            an adjustable outlet tube assembly disposed opposite the trajectory control
- 14            assembly, the adjustable outlet assembly having an adjustable outlet tube
- 15            selectively extendable into the interior cavity of the inductor chamber, the
- 16            adjustable outlet tube having a first end with a cross-sectional area greater
- 17            than a cross-sectional area of a second end of the outlet tube; and
- 18            a cover assembly disposed in the interior cavity between the inlet tube and
- 19            the outlet tube.

1     23.     A method of generating a stream of pressurized air and product generated with an  
2     inductor assembly for conveyance to a remote location, the inductor assembly having an  
3     inlet and an outlet, the method comprising the acts of:

4             purging product deposited in and downstream of the outlet of the inductor  
5     assembly toward the remote location; and

6             preventing product from entering the outlet tube during the act of purging of the  
7     deposits of product.

1     24.     A method of conveying product from a hopper with forced air to a remote  
2     location in an agricultural environment, the method comprising the acts of:

3             providing a nurse inductor assembly configured to generate a combined stream of  
4     air and entrained product, the assembly having a chamber operable to receive the product  
5     from the hopper, and an outlet tube operable to communicate the stream of pressurized  
6     air and product from the inductor assembly for conveyance to the remote location;

7             providing a trajectory control assembly configured to receive the pressurized air  
8     stream; and

9             rotating the trajectory control assembly to selectively direct the stream of  
10     pressurized air into the inductor chamber.

1    25.    A method of conveying a product from a hopper with forced air to a remote  
2    location, the method comprising the acts of:  
3            providing a nurse inductor assembly configured to generate a combined stream of  
4    air and entrained product, the nurse inductor assembly having a chamber operable to  
5    receive the product from the hopper, and an inlet tube operable to receive stream of  
6    pressurized air;  
7            providing an adjustable outlet assembly operable to communicate the stream of  
8    pressurized air and product from the inductor assembly for transport to the remote  
9    location; and  
10          moving the adjustable outlet assembly inward or outward with respect to the  
11    product in the inductor chamber.

1     26.     A product conveyance system for distributing a supply of product in an  
2     agricultural environment, comprising:  
3             a hopper configured to contain the supply of product;  
4             a pressurized air source operable to provide a stream of pressurized air;  
5             a distribution system configured to apply the product in the agricultural  
6     environment; and  
7             an inductor assembly configured to provide a combined stream of pressurized air  
8     and product to the distribution system, the inductor assembly including:  
9             an inductor chamber that defines an interior cavity configured to receive a  
10            supply of product, the inductor chamber including a forward sidewall, a  
11            rearward sidewall, and a bottom wall therebetween;  
12            an inlet tube extending through the forward sidewall and configured to  
13            direct a stream of pressurized air toward the supply of product in the  
14            interior cavity of the inductor chamber so as to generate the combined  
15            stream of pressurized air and product;  
16            an outlet tube extending through the rearward sidewall opposite the inlet  
17            tube, the outlet tube being configured to discharge the combined stream of  
18            air and product from the inductor chamber, the outlet tube having a first  
19            end and a second end, the first end of the outlet tube having a cross-  
20            sectional area greater than a cross-sectional area of the second end of the  
21            outlet tube; and

22 a cover assembly disposed between the inlet and outlet tubes, the cover  
23 assembly is selectively adjustable to regulate a disposition of the product  
24 relative to the inlet tube and the outlet tube.

25 27. The product conveyance system as recited in claim 26, wherein the cover  
26 assembly is connected to the inlet and outlet tubes.

27 28. The product conveyance system as recited in claim 26, wherein at least one side  
28 of the cover assembly is selectively moveable.

29 28.1 The product conveyance system as recited in claim 26, wherein the cover  
30 assembly includes an at least one flap pivotally coupled to a cover member.

31 29. 30 The product conveyance system as recited in claim 26, including an adjustment  
32 mechanism operable to selectively adjust one or more cover assemblies.

30. A product conveyance system for distributing a supply of product in an agricultural environment, comprising:

- a hopper configured to contain the supply of product;
- a pressurized air source operable to provide a stream of pressurized air;
- a distribution system configured to apply the product in the agricultural environment; and
- an inductor assembly configured to provide a combined stream of pressurized air and product to the distribution system, the inductor assembly including:
  - an inductor chamber that defines an interior cavity configured to receive a supply of product, the inductor chamber including a forward sidewall, a rearward sidewall, and a bottom wall therebetween;
  - an inlet tube extending through the forward sidewall and configured to direct a stream of pressurized air toward the supply of product in the interior cavity of the inductor chamber so as to generate the combined stream of pressurized air and product;
  - an outlet tube extending through the rearward sidewall opposite the inlet tube, the outlet tube being configured to discharge the combined stream of air and product from the inductor chamber, the outlet tube having a first end and a second end, the first end of the outlet tube having a cross-sectional area greater than a cross-sectional area of the second end of the outlet tube; and

22 a cover assembly disposed between the inlet and outlet tubes, the cover  
23 assembly is selectively adjustable to regulate a disposition of the product  
24 relative to the inlet tube and the outlet tube.

25 wherein the cover assembly is connected to the inlet and outlet tubes, wherein the cover  
26 assembly includes an at least one flap pivotally coupled to a cover member, and an  
27 adjustment mechanism operable to selectively adjust one or more cover assemblies.

1 31. <sup>3d</sup> A method of conveying a supply of product from a hopper with forced air to a  
2 remote location, the method comprising the acts of:  
3 providing a nurse inductor assembly configured to generate a combined stream of  
4 air and entrained product, the nurse inductor assembly having a chamber operable to  
5 receive the supply of product from the hopper, an inlet operable to provide a stream of  
6 pressurized air into the chamber to create the combined stream of air and entrained  
7 product; and an outlet operable to communicate the combined stream of air and entrained  
8 product from the chamber;  
9 providing a selectively adjustable cover assembly between the inlet and the outlet;  
10 and  
11 moving the cover assembly to selectively regulate a position of the supply of  
12 product in the chamber relative to either the inlet and the outlet.

13